

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2001-242956**

(43)Date of publication of application : **07.09.2001**

(51)Int.Cl.

G06F 1/16

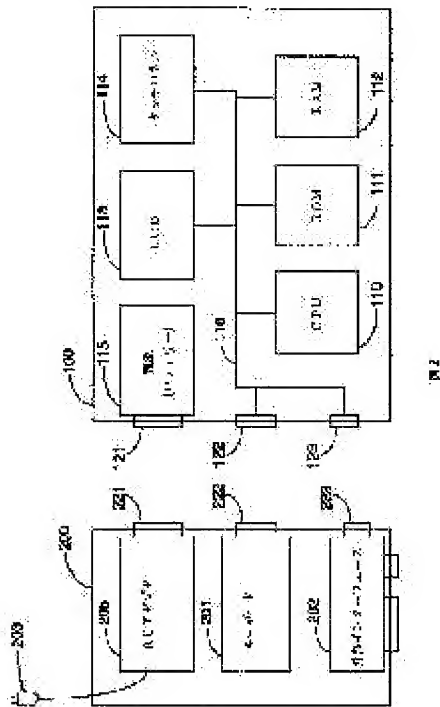
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G06F 15/02

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## (54) PORTABLE INFORMATION TERMINAL DEVICE AND ITS SYSTEM



### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a portable information terminal system capable of input operation from a touch panel and electric charging operation and input operation taking a space factor and operation into consideration.  
**SOLUTION:** The portable information terminal system consists of the portable information terminal device 100 which provides LCD 113, the touch panel 114 for inputting by depressing, a CPU 110 for controlling those units, and a RAM 112 for storing both input information and information to be processed, as well as a cradle 200 which is provided separately from the information terminal device 100 and includes an AC adaptor 205 for charging a battery 115 of the information terminal device 100. A keyboard 201 is located in the cradle 200, connectors 221, 222 are arranged in the terminal device 100 and the cradle 200 respectively to provide an input signal

from the key board 201 to the terminal device 100, and the CPU 110 carries out the predetermined process in response to the input from both the touch panel 114 and the

keyboard 201 of the terminal device 100.

[0001]

[Field of the Invention]With the Personal Digital Assistant device of composition of inputting from the touch panel on a display screen, and a Personal Digital Assistant device, especially this invention about the Personal Digital Assistant system provided with the charging equipment formed in the different body Connection of charging equipment, While connecting a keyboard simultaneously, it is related with the Personal Digital Assistant device and form information terminal system which also enabled the input from a keyboard in addition to the input means of a Personal Digital Assistant.

[0002]

[Description of the Prior Art]A main part consists of a unit different from charging equipment or a keyboard, and a touch panel is provided on the display screen of the display provided in said main part, The Personal Digital Assistant device which was made to perform an input from this touch panel is publicly known as indicated by JP,11-232227,A and JP,10-20962,A, for example. A display is stood to a stand body, it is held, and to the rechargeable battery with which the display device body was equipped, pedestals of a stand body are consisted of by the former so that charge is possible, and the composition which enabled it to also perform an input to a display device body with the keyboard connected to the pedestal via the connector is indicated.

[0003]When a display panel is made to hold to the supporting structure, a storage battery is charged, and the composition which can perform an input from the keyboard connected via the connector is indicated by the latter.

[0004]

[Problem(s) to be Solved by the Invention]In said conventional technology, when inputting with a keyboard, charging [ if constituted by one are not, but ] a Personal Digital Assistant device for this reason, charging equipment and the keyboard had to make connection of charging equipment and connection of a keyboard independently, respectively, and their operation was troublesome. Even if the Personal Digital Assistant device is small, a keyboard other than charging equipment is required for it, and there was a problem in a space factor.

[0005]This invention was made in view of the actual condition of such conventional technology, and after it takes a space factor and operativity into consideration while alter operation from a touch panel of the purpose was completed, there is in providing the Personal Digital Assistant device in which charging operation and input operation are possible, and a Personal Digital Assistant system.

[0006]

[Means for Solving the Problem]A displaying means as which the 1st means displays information in order to attain said purpose, An input means which it is provided in a front face of this display screen, and is inputted by carrying out pressing operation, In a Personal Digital Assistant device provided with a control means which controls these, a memory measure which memorizes inputted information and information which should be processed, a power supply means which supplies a power supply to each of these means, and a charging means which charges this power supply means, While establishing said charging means to a device main frame, enabling free removal, a connecting means for inputting an input signal by keyboard and this keyboard into said control means is

provided in said charging means, Said control means enabled it to perform predetermined processing according to an input from said keyboard in addition to said input means.

[0007]In order to attain said purpose, the 2nd means, A displaying means which displays information, and an input means which it is provided in a front face of this display screen, and is inputted by carrying out pressing operation, A Personal Digital Assistant device provided with a control means which controls these, and a memory measure which memorizes inputted information and information which should be processed, In a Personal Digital Assistant system which consists of charging equipment provided with a charging means which is provided in this Personal Digital Assistant device and different body, and charges a battery of said Personal Digital Assistant device, to said charging equipment, with keyboard \*\*\*\*\*. A connecting means for inputting an input signal by this keyboard into said Personal Digital Assistant device is provided in said Personal Digital Assistant device and said charging equipment, Said control means enabled it to perform predetermined processing according to an input from a keyboard by the side of said charging equipment in addition to said input means by the side of a Personal Digital Assistant device.

[0008]In this case, it is good to establish further a connecting means for making connection with an external instrument to said charging equipment, and for said control means to perform processing according to an input from said external instrument, and/or to enable it to output a processing result to said external instrument.

[0009]In addition to mechanical contacting means, such as a connector, infrared ray communication can also be used as a connecting means.

[0010]

[Embodiment of the Invention]Hereafter, the embodiment of this invention is described with reference to drawings.

[0011]Drawing 1 is an outline perspective view showing the Personal Digital Assistant device 100 concerning the embodiment of this invention, what is called PDA (Personal Digital Assistant), and the cradle 200 provided with the function to charge to this PDA. In the figure, the touch pen 101 is illustrated by the front face of the Personal Digital Assistant device 100, and the display and input device 102 is formed in the front-face side of the Personal Digital Assistant device 100 by the side of the back. The keyboard 201, the external interface 202, and AC plug 203 are formed in the cradle (cradle: charging equipment) 200 illustrated by the Personal Digital Assistant device 100 bottom, The insertion groove 204 for equipping with said Personal Digital Assistant device 100 is formed in the rear top. The keyboard 201 can be formed in the anterior part side of the upper surface of the cradle 200 at one, and can be inputted by keyboard now to the Personal Digital Assistant device 100 with which the insertion groove 204 was equipped so that drawing 1 may show.

[0012]The Personal Digital Assistant device 100 is the structure where itself can operate alone by battery-operated, can be carried and can be used by a place where one has gone etc. The touch pen 101 is used for the input of the display and input device 102 of the Personal Digital Assistant device 100.

[0013]The display and input device 102 is the structure which arranged the touch panel 114 (refer to drawing 2) on the front face of LCD(liquid crystal display) 113, and can perform a desired function by inputting into the touch panel 114 with the touch pen 101 according to the display information displayed on LCD113.

[0014]The charge over the Personal Digital Assistant device 100, connection of the external instrument which uses the external interface 202, and the input from the keyboard 201 of the cradle 200 are attained by inserting the Personal Digital Assistant device 100 in said insertion groove 204, and attaching it.

[0015]Since an input device is the touch panel 114 when performing a document input etc. from the Personal Digital Assistant device 100 concerning this embodiment, with the touch pen 101 A handwritten input, Or although the character displayed on LCD113 must be chosen and time is taken compared with the keyboard input of a personal computer etc., What had to connect the keyboard via the external interface in the conventional cradle for inputting by keyboard, Since the keyboard 201 is formed in cradle 200 self and it can input from the keyboard 201 of the direct cradle 200, it is very convenient. In the former, especially the cradle 200 is mainly installed in the indoor regular place, That it was common attaching the Personal Digital Assistant device 100 brought home from the place where one has gone, and having used it for the external interface 202 to a personal computer, a printer, etc., connecting, It is dramatically effective that it became unnecessary to attach a keyboard to alter operation or operation of transmission to a personal computer one by one, when aiming at improvement in operativity.

[0016]The external interface 202 is the composition which was also in the conventional cradle, and is a connector which can connect with external peripheral equipment. This connector consists of a parallel connector for connecting with the RS232C connector for attaching the serial cable for connecting with a personal computer etc., and a printer.

**Since the Personal Digital Assistant device itself will become large and portability will be lost if the connector of general standards, such as a RS232C connector, is attached to the Personal Digital Assistant device 100, the connecting means for connecting the cradle 200 with the Personal Digital Assistant device 100 forms the interface of the original standard of each company, and attains the miniaturization of the Personal Digital Assistant device 100. By recognition since it is installed in the fixed indoor place, even if it becomes somewhat large, that it is satisfactory, a cradle provides the connector of a general standard and is enabling connection with peripheral equipment.**

[0017]AC plug 203 is connected to an electric socket in order to supply a power supply to the battery charger (this example AC adapter drawing 2) 205 of built-in in the cradle 200.

[0018]The insertion groove 204 is a portion for connecting the Personal Digital Assistant device 100 to the cradle 200 mechanically. An electric connection method is performed by infrared either the same contact connection as the case where the connection and the cellular phone which use the connector provided in the inside of the insertion groove 204 are charged or connection.

[0019]Drawing 2 is a block diagram showing the electric constitution of the Personal Digital Assistant device 100 and the cradle 200 concerning the embodiment of this invention.

[0020]CPU110, ROM111, RAM112, LCD113, the touch panel 114, and the power supply (battery) 115 are formed in the Personal Digital Assistant device 100. The power connector 121, the keyboard connector 122, and the interface connector 123 are formed as a connector, The power connector 121 is connected to the power supply 115, and the keyboard connector 122 and the interface connector 123 are connected to the bus 116 to which CPU110, ROM111, RAM112, LCD113, and the touch panel 114 are connected.

[0021]AC adapter 205, the keyboard 201, and the external interface 202 which were connected to the AC flag 203 are formed in the cradle 200. The power connector 221 connected to AC adapter 205 as a connector, the keyboard connector 222 connected to the keyboard 201, and the interface connector 223 connected to the external interface 202 are formed.

[0022]Said CPU110 controls the Personal Digital Assistant device 100 whole. Namely, read-out of the system action program stored in ROM111, When reading and writing of the user datum of RAM112, the display of LCD113, processing of the data inputted into the touch panel 114, the keyboard connector 122, and the interface connector 123 are connected, processing according to this is performed. The operation program of CPU110 is built in ROM111 and CPU110 operates according to this operation program. RAM112 performs momentary preservation of the data which CPU110 is processing, storing of the indicative data displayed on LCD113, preservation of the data which the user inputted from the touch panel 114, etc.

[0023]LCD(liquid crystal display) 113 is an output unit, and performs the various displays of the entry content from the touch panel 114, the output which CPU110 processed according to the entry content, etc. The touch panel 114 is an input device, opposes the electric conduction side of the upper electrode of the plastic film which performed transparent electric conduction processing to the surface, and the lower electrode which has a transparent electric conduction side in a glass surface similarly, and has the composition of having put the dot spacer between them. If it pushes with a dedicated pen from on an upper electrode, this transparent electrode of two sheets will contact and a switch will be turned on. moreover -- all, since voltage is applied to the both ends of a flat-tapped transparent electrode [ like ] in every direction and potential distribution is formed in an electrode surface, CPU110 can be grasped for an entry content by CPU110 detecting a voltage level when an up-and-down electrode contacts and a switch is turned on, and computing the input position simultaneously. Selection of the data displayed on LCD113 by this, a handwritten input, etc. can be performed.

[0024]The power supply 115 builds in the battery for making this Personal Digital Assistant device 100 drive. **The power connector 121 is a connector provided in the Personal Digital Assistant device 100 side, if the Personal Digital Assistant device 100 is inserted in said insertion groove 204, will fit in with the power connector 221 provided in the cradle 200 side, and will hold a contact state.** The keyboard connector 122 fits in with the keyboard connector 222 which is a connector provided in the Personal Digital Assistant device 100 side, and was similarly provided in the cradle 200 side, and holds a contact state. The interface connector 123 fits in like the interface connector 223 which is a connector provided in the Personal Digital Assistant device 100 side, and was provided in the cradle 200 side, and holds a contact state.

[0025]AC adapter 205 is for charging the battery of the power supply 115 of the Personal Digital Assistant device 100, and is connected to the power connector 221. AC plug 203 is connected to an electric socket in order to supply a power supply to AC adapter 205. If the keyboard 201 is connected to the keyboard connector 222 and it is connected to the keyboard connector 122 by the side of the Personal Digital Assistant device 100 as mentioned above, it will enter under control of CPU110 and a keyboard input will become possible. The external interface 202 performs relay of the peripheral equipment and the Personal Digital Assistant device 100 which are connected with the interface

connector 223 and connected to the cradle 200.

[0026]If constituted in this way, in addition to the charging function of the cradle 200, it can input by keyboard to the Personal Digital Assistant device 100 from the keyboard 201 formed in the cradle 200 in one, and improvement in operativity can be aimed at.

[0027]Although the keyboard 201 is formed in the cradle 200 in this embodiment, Make AC adapter 205 which can charge the power supply (battery) 115 become independent, and to this AC adapter 205 A keyboard, It can also constitute so that the connecting means (connector) for inputting the input signal from a keyboard into said Personal Digital Assistant device 100 may be provided in said Personal Digital Assistant device 100 and AC adapter 205. This composition is equivalent to the composition which deleted the interface connector 123 from the Personal Digital Assistant device 100, and deleted the external interface 202 and the interface connector 223 from the cradle 200. If constituted in this way, it does not have an external-interface function, but the keyboard input to the Personal Digital Assistant device 100 is attained with easier composition. In other words, this composition is equivalent to the composition which constituted the charging equipment (it corresponds to AC adapter 205) of the battery 115 of a Personal Digital Assistant device dismountable, and formed the keyboard 201 and the keyboard connector 222 in this charging equipment.

[0028]In said embodiment, although the information and telecommunications of the Personal Digital Assistant device 100 and the cradle 200 are performed by the contact process via the connector, it is also possible to constitute so that it may carry out by non-contact about information and telecommunications. This embodiment is shown in drawing 3.

[0029]Drawing 3 is a block diagram showing the composition of the Personal Digital Assistant system concerning other embodiments. The same reference mark is given to each part equivalent to said embodiment, and the overlapping explanation is omitted suitably.

[0030]This embodiment is what replaced with the keyboard connector 122,222 and the interface connector 123,223 in said embodiment, and adopted infrared ray communication systems (IrDA: Infrared Data Association), It differs from said embodiment in that the IrDA module 310,320 was formed in the Personal Digital Assistant device 100 and cradle 200 side, respectively. Each IrDA module 310,320 is provided with the amplifier 314,324 which amplifies the output signal from the driver 312,322 and PD(photo-diode) 313,323 which drive LED311,321 and LED311,321, and PD313,323, It is connected to CPU110,210, respectively. CPU210, ROM211, and RAM212 are provided and it is connected also to the cradle 200 side via the keyboard 201 and the external interface 202, and the bus 216. A sending signal (TXD) is outputted to each LED311,321 from each CPU110,210, and an input signal (RXD) is inputted into each CPU110,210 from each amplifier 314,324. In addition, especially, each part which is not explained is constituted on a par with the above-mentioned embodiment.

[0031]In addition to the function of CPU in the above-mentioned embodiment, input and output of the sending signal 315 and the input signal 316 are performed for connection with the IrDA module 310, and CPU110 transmits and receives data by serial communication. In addition to the operation program of CPU110, ROM111 also builds in the control program of the IrDA module 310. RAM112 performs momentary preservation of the data which is transmitted to the IrDA module 310 in addition to the function of

RAM in the above-mentioned embodiment, and the data received from the IrDA module 310. The IrDA module 310 is the device with which the transmission element and receive element which can perform transmission and reception of the IrDA module 320 and data by the side of opposite by serial communication were united. The sending signal 315 is a serial sending signal, and it is connected to the transmitting side of the serial port of CPU110, and it tells this to the driver 312. The driver 312 drives LED311 with the input signal from CPU110, and LED311 emits light in an infrared signal. PD313 receives the infrared signal received from the IrDA module 320 by the side of opposite, The signal which received light is amplified with the amplifier 314, is changed into the signal of the high level/low level which CPU110 can receive, and tells the receiver of the serial port of CPU110 as the input signal 316.

[0032]On the other hand by the cradle 200 side, CPU210 transmits the data inputted from the keyboard 201 to the Personal Digital Assistant device 100 through the IrDA module 320, Transmission and reception of the data according to the apparatus connected to the external interface 202 are performed with the Personal Digital Assistant device 100 through the IrDA module 310,320. ROM211 builds in the operation program of CPU210. RAM212 performs momentary preservation of the data which CPU210 is processing etc. [0033]The data inputted from the keyboard 201 is transmitted to CPU210, and CPU210 carries out the temporary storage of the received data to RAM212 according to the program stored in ROM211. The stored data is changed into the serial signal (digital signal of high level/low level) of the form which can carry out serial communication by CPU210, and is transmitted to the driver 322 of the IrDA module 320 as the sending signal 325 from the serial port of CPU210. An infrared signal is transmitted when the driver 322 makes LED321 turn on / switch off according to a serial signal. In the Personal Digital Assistant device 100 side, PD313 receives this, changes the received infrared signal into an analog signal, and transmits to the amplifier 314. The amplifier 314 is changed into the digital signal which amplifies the received analog data and CPU110 can receive. The changed digital signal is sent to the serial port of CPU110 as the input signal 316. Thereby, CPU110 can recognize the received data, displays the data inputted from the keyboard 201 according to the contents of the received data on LCD113, or stores it in RAM112.

[0034]

[Effect of the Invention]Since charging equipment and the keyboard are one according to this invention, a device or a system excellent in the space factor can be provided. Since the charge and the alter operation from a keyboard to a Personal Digital Assistant become possible even if it does not perform operation for connection in particular only by equipping with a Personal Digital Assistant, it is user-friendly and a device or a system excellent in operativity can be provided.

[Claim 1]A displaying means which displays information.

An input means which it is provided in a front face of this display screen, and is inputted by carrying out pressing operation.

A control means which controls these.

A memory measure which memorizes inputted information and information which should be processed.

A power supply means which supplies a power supply to each of these means, and a

charging means which charges this power supply means.

While being the Personal Digital Assistant device provided with the above and establishing said charging means to a device main frame, enabling free removal, A connecting means for inputting an input signal by keyboard and this keyboard into said control means is provided in said charging means, and said control means enabled it to perform predetermined processing according to an input from said keyboard in addition to said input means.

[Claim 2]A displaying means which displays information.

An input means which it is provided in a front face of this display screen, and is inputted by carrying out pressing operation.

A control means which controls these.

A Personal Digital Assistant device provided with a memory measure which memorizes inputted information and information which should be processed.

A charging means which is provided in this Personal Digital Assistant device and different body, and charges a battery of said Personal Digital Assistant device.

Are the Personal Digital Assistant system provided with the above, and to said charging equipment with keyboard \*\*\*\*\*. A connecting means for inputting an input signal by this keyboard into said Personal Digital Assistant device is provided in said Personal Digital Assistant device and said charging equipment, Said control means enabled it to perform predetermined processing according to an input from a keyboard by the side of said charging equipment in addition to said input means by the side of a Personal Digital Assistant device.

[Claim 3]The Personal Digital Assistant system according to claim 2 establishing further a connecting means for making connection with an external instrument to said charging equipment, and said control means's performing processing according to an input from said external instrument, and/or outputting a processing result to said external instrument.

[Claim 4]The Personal Digital Assistant system according to claim 2 or 3, wherein said connecting means is performed by infrared ray communication.



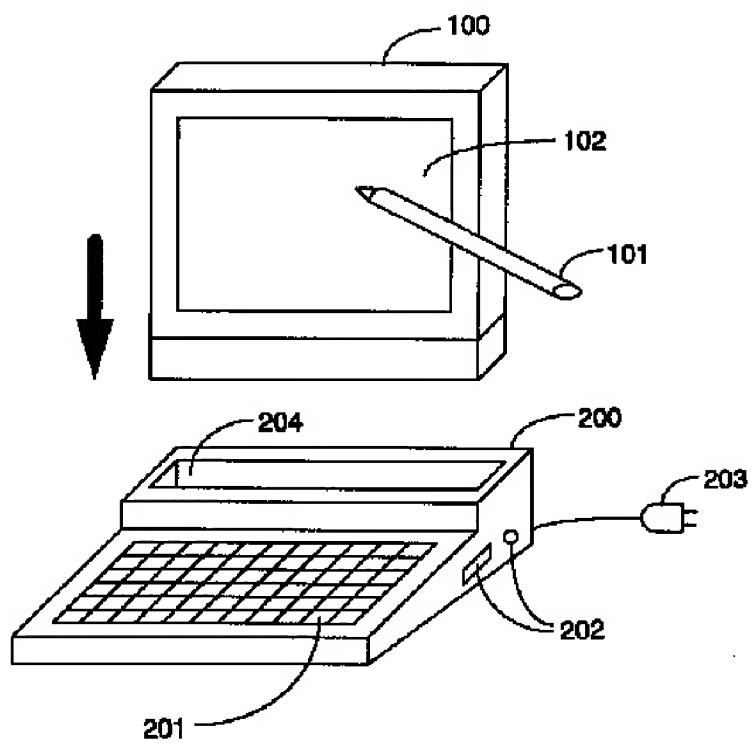


図 1

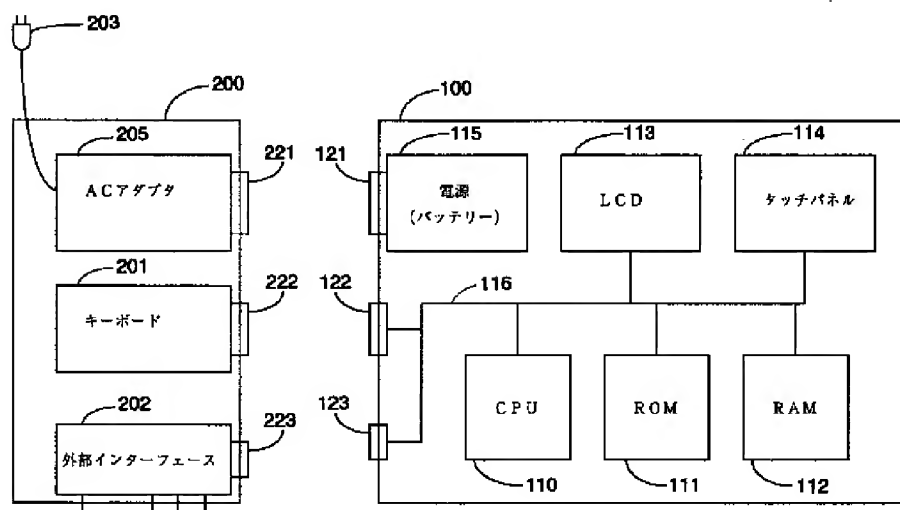


図 2

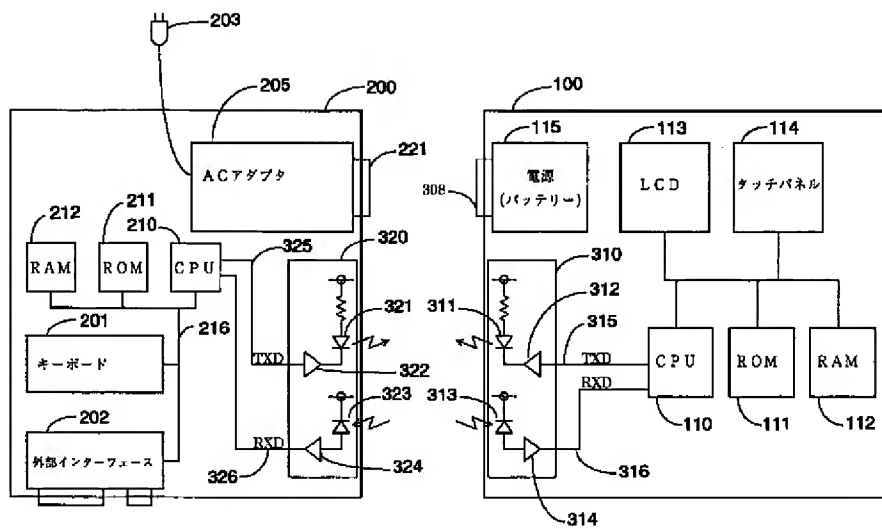


図 3